

## Topical immunomodulators TIMs

Drugs modulate immune response of skin

**Definition:** Drugs that modify the local immune response of the skin they either up regulate or down regulate the immune response.

### Classifications:

1) Steroidal topical drugs. → usually Immosuppress

2) Non steroidal topical drugs:

a. Calcineurin inhibitors "CI"

- Tacrolimus (protopic). 0.1-0.3
- Pimecrolimus (Elidel).
- Sirolimus.

- like steroid & limited side effects  
- is having 2-3%  
- face vitiligo (60)

b. Contact allergens:

- Diphenyl cyclopropanone (DPCP). Pp acute allergic contact dermatitis before band
- Squaric acid dibutyl ester (SADBE).

c. Immune response modifiers (Immunostimulators).

- Imiquimode (Aldara).

→ (Immunostimulant)

d. Miscellaneous agents:

- Calcipotriol.
- Intralesional interferone.
- Anthralin.

PS  
PAA

→ rarely absorbed enough for  
→ Not enough to be immunosuppressive at systemic level  
→ No skin atrophy

### Topical calcineurin inhibitors:

- Topical pimecrolimus is rarely absorbed enough from the skin even to be detected in blood & certainly not enough to be immunosuppressive of the systemic level.
- Skin immune function is back to normal within 2-4 weeks after discontinuing the topical drugs.
- No skin atrophy occur with topical calcineurin inhibitors.

C.I. < 24 years

Topical calcineurin inhibitors

① Indication: anti-inflammatory agents that alter the release of inflammatory mediators without affecting the immune system

- ② Types:
- ① Tacrolimus (protopic)
  - ② Pimecrolimus (Elidel)
  - ③ Sirolimus X

③ Pharmacokinetics:

• Topical Pimecrolimus → Rarely absorbed enough from skin to induce immunosuppression at systemic level  
↓  
not enough  
No skin atrophy XX

Pimecrolimus differs from corticosteroids.

Corticosteroids → ① CS → non selective have many side effects  
① Deplete Lcs from epidermis  
② skin atrophy hypothalamic-pituitary-gonadal axis in children  
③ telangiectasia, suppress

non selective

② Pimecrolimus

① selectively target T cells (most cells) → inhibits synthesis, release of inflammatory cytokines  
② No effect on keratinocytes, fibroblasts, endothelial cells, Lcs  
③ No skin atrophy  
④ Permeates much less through skin than corticosteroids

1. Metastasis (achar)  
 2. Indical  
 3. Dyschondrocyte  
 4. Chronic achar  
 5. Pratha  
 6. ASD  
 7. 3D  
 8. Pericardial  
 9. Cytol D  
 10. CFA apposed

1. (2) Punctate  
 2. CT disorders  
 3. other  
 4. Face vitiligo  
 5. AD  
 6. DLE  
 7. Morphea  
 8. LSA  
 9. Periorbital  
 10. (leukemia and skin)  
 11. 2nd stage  
 12. glucose  
 13. acid

1. (1) SE  
 2. (2) allergic  
 3. (3) Rosacea like  
 4. (4) C-I  
 5. (5) K-24  
 6. (6) Pterygium  
 7. (7) Chalazion  
 8. (8) Chalazion  
 9. (9) Chalazion  
 10. (10) Chalazion  
 11. (11) Chalazion  
 12. (12) Chalazion  
 13. (13) Chalazion  
 14. (14) Chalazion  
 15. (15) Chalazion  
 16. (16) Chalazion  
 17. (17) Chalazion  
 18. (18) Chalazion  
 19. (19) Chalazion  
 20. (20) Chalazion

Use 1 at night  
 2. six to eight  
 3. Cancer with  
 4. WBC leukemia  
 5. mutagenic  
 6. effect

Imiquimod (5-Fluorouracil)  
 (Immune Response modifier)  
 1) Local cytotoxic Release of  $IFN\alpha$ ,  $TNF$ ,  $IL1, 2, 8, 6, 9, 10, 12$   
 IFN  $\rightarrow$  viral Replication directly, protect adjacent cells from infection  
 2) Promote cell mediated Imm response  
 3) Stimulate  $TLR-7$   $\rightarrow$  activate dendritic cells, other Imm cells

4)  $TLR-7$  on APC  $\rightarrow$  production of cytokines  
 $Th1$  Response  
 •  $TNF\alpha$   
 •  $IFN\alpha, \gamma$   
 •  $IL1, 2, 6, 8, 12$   
 $\rightarrow$  Cytotoxic Response

actions  $\rightarrow$  antiviral  
 $\rightarrow$  Tumor  
 $\rightarrow$  Immunomodulatory (Immunostimulatory)  
 + CMI against Tumor cells, virally infected cells

Indications:

1) Antiviral  
 2) Genital warts (Condyloma acuminata) 1 once daily at bed time  
 3 Times / week for 16w

Should be washed after 6-10h after application.

No occlusion  
 No intercourse  
 Not used after surgery  $\rightarrow$  applied only on healed tissue

+ it doesn't play on physical destruction of lesion but directed for eradication of HPV

- ② MC
- ③ EDV
- ④ common with

② anti-tumor

- AK, Bowen's, SCC, Spindle BCC, Paget's, actinic cheilitis.
- Keloid, hypertrophic scar
- Haemangioma
- lentigo maligna

- Porokeratosis
- Haemangioma

Morphea

Porokeratosis

ASA

SE: ① local irritation (sunburn, bug, pruritus)  
 ② hyperpigmentation